Group Question Ch4 Single Gene Inheritance

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1. A tea plant is Tt. Which of the following statements is correct?
    1. Its genotype is Tt, and its phenotype is dwarf.
    2. Its phenotype is Tt, and its genotype is dwarf.
    3. **Its genotype is Tt, and its phenotype is tall.**
    4. Its phenotype is Tt, and its genotype is fall.

2. A Tt plant is crossed to a tt plant. What is the expected ratio of phenotypes for offspring from this cross?

    1. 3 tall : 1 dwarf
    2. **1 tall : 1 dwarf**
    3. 1 tall : 3 dwarf
    4. 2 tall : 1 dwarf

	T	t
t	Tt	tt
t	Tt	tt

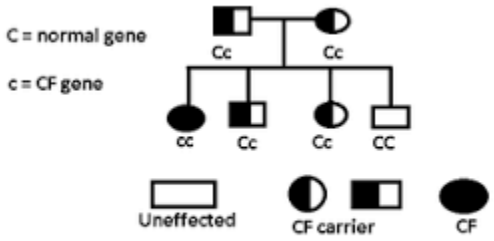
3. You may need to refer back to Chapter 3 meiosis discussion. If a plant is Tt, at which stage do the T and t allele segregate from each other?

    1. Anaphase of mitosis
    2. **Anaphase of meiosis I**
    3. Anaphase of meiosis II
    4. None of the above is the state at which segregation occurs.

4. If a child with CF has two parents who do not have the disease, what is the risk that a future sibling will inherit CF? Draw a pedigree and punnett square, and upload the picture.

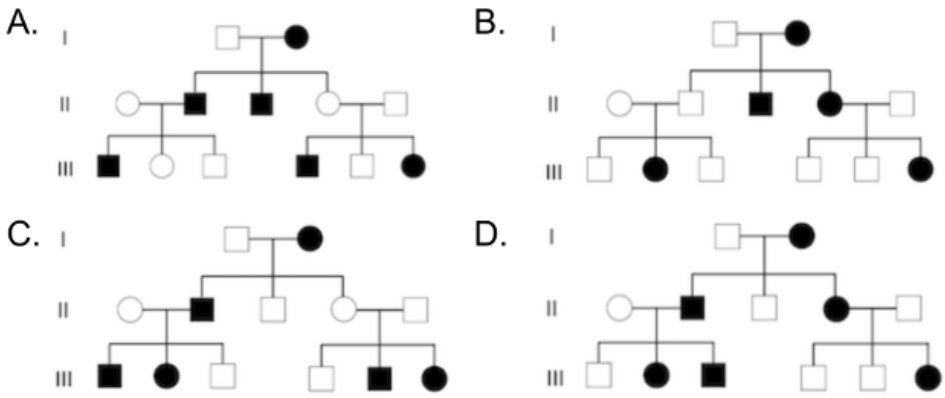
	C	c
C	CC	Cc
c	Cc	cc

Results in 3:1 ratio of *C-:cc*



¼ chance the sibling will inherit the disease

Which one displays the Huntington's disease pedigree?



Answer: D

Mendelian genetics

	Cross 1	Cross 2	Cross 3
Parents	Red Male x Red Female	Green Male x Red Female	Green Male x Green Female
Offspring	75 red	50 red	0 red
	25 green	50 green	100 green

The data above represent the results of three different crosses in which a single gene determines whether a certain organism is red or green.

Which of the following best describes the mechanism of inheritance of the gene?

Choose 1 answer:

(A) The allele for green is an autosomal dominant allele because no red offspring are produced in cross 3.

(B) The allele for green is an autosomal recessive allele because a $3:1$ phenotypic ratio of red-to-green is observed in cross 1.

(C) The allele for red is an autosomal recessive allele because no red offspring are produced in cross 3.

(D) Color is a codominantly inherited trait because a $1:1$ phenotypic ratio of red-to-green is observed in cross 2.

Answer: C

A group of students are studying flower color inheritance in the garden pea plant (*Pisum sativum*). They obtain a purple-flowered pea plant of unknown ancestry, allow it to self-pollinate, and collect 60 of its seeds. After planting the seeds, they observe the growth of 42 purple-flowered plants and 18 white-flowered plants.

Which of the following best explains the flower colors seen in the offspring?

Choose 1 answer:

(A) The flower color changes as the plants mature.

(B) A somatic mutation in the flower color gene produced the white flower color.

(C) White flower color is a trait recessive to purple flower color.

(D) Purple flowers and white flowers are codominant.

Answer: C